

Future directions

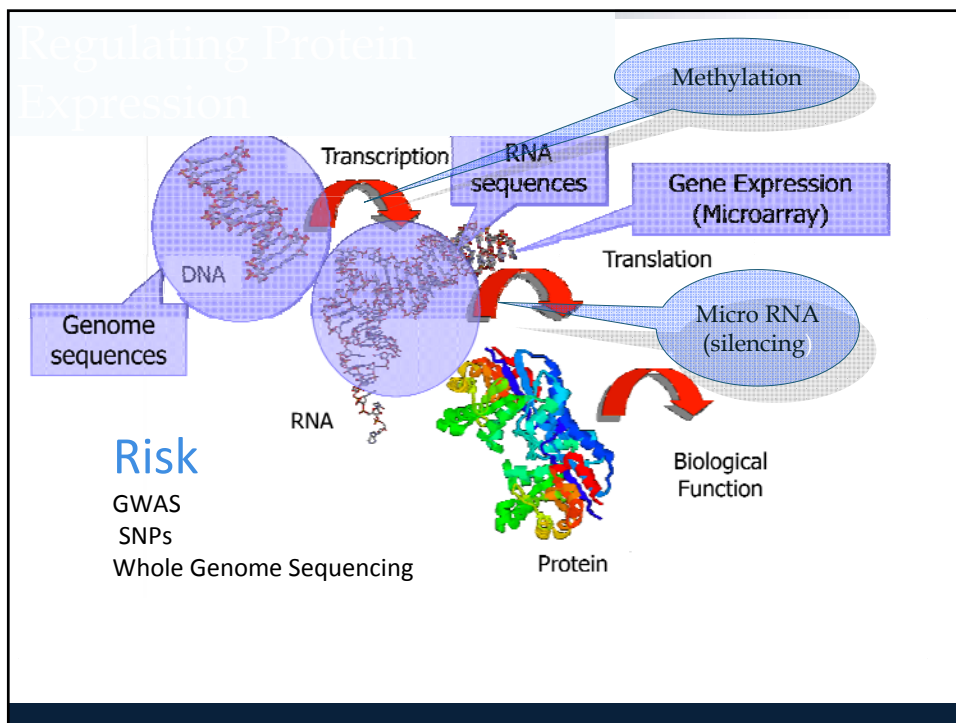
Complete the data set needed for the comprehensive systems biology analysis of GWI

Underway: DOD study with 8 assessment points post exercise to better map out the systems interactions

Pending review (Merit): Methylation/microRNA analysis of the same cohorts

LOI accepted (DOD): Proteomic/metabolomics study

CSP 585 assessing genetic risk

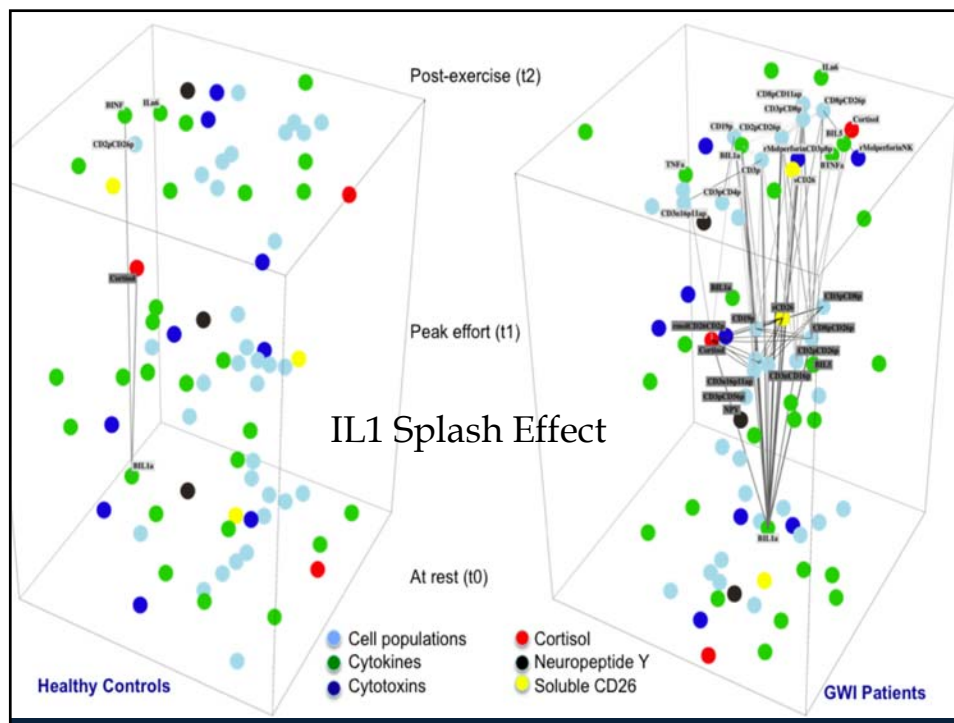


Future directions

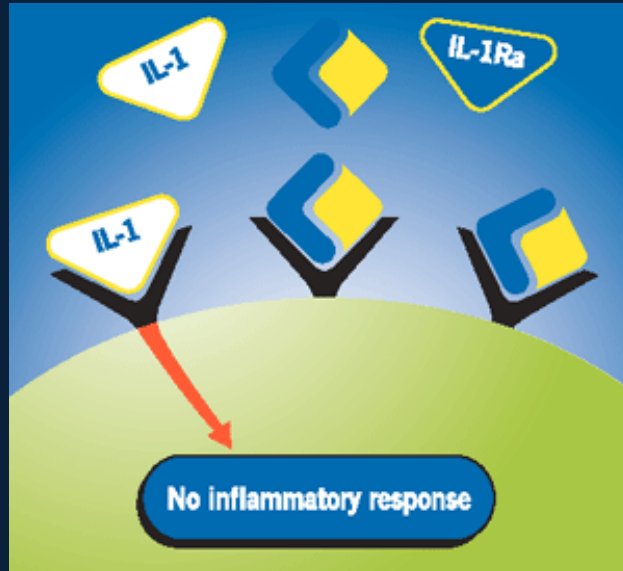
Apply computational models to develop
intervention strategies to GWI

In development: DOD Consortium protocol
focused on systems
biology/computational modeling in
animal and human systems to develop
additional models

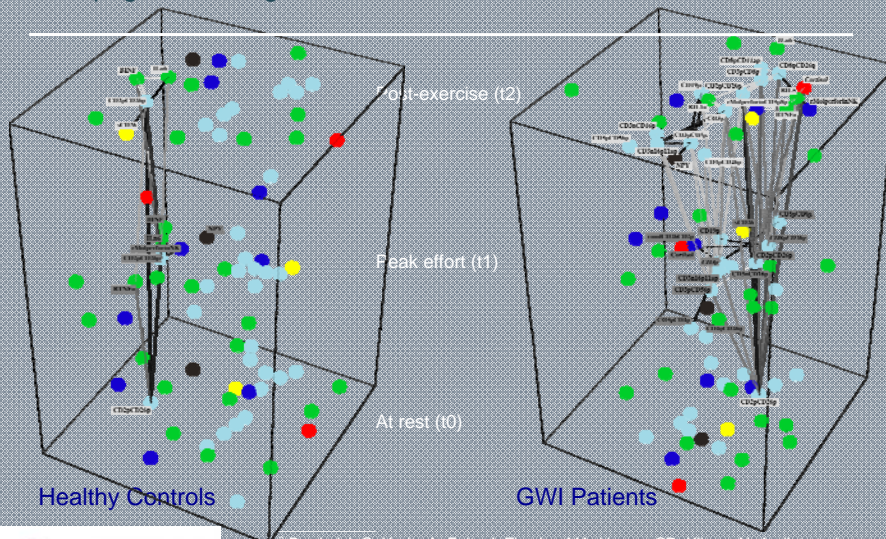
LOI accepted: Phase 1 trial of IL1 receptor
antagonist in GWI



IL1 receptor antagonist

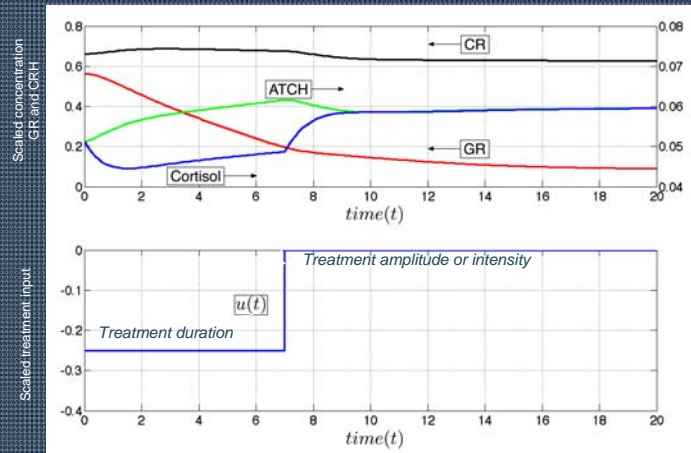


Propagation through Time of CD2+/CD26+



Broderick G, Kreitz A, Fuite J, Fletcher MA, Vernon SD, Klimas N. A pilot study of immune network remodeling under challenge in Gulf War Illness. *Brain Behav Immun*. 2011 Feb;25(2):302-13.

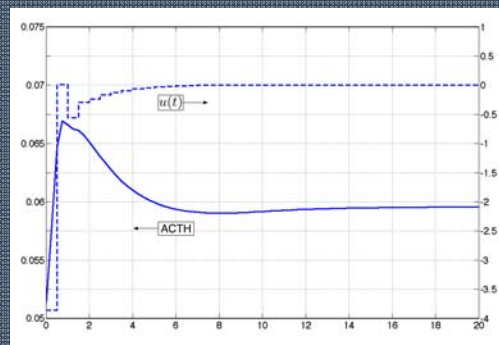
Sub-optimal Approximation of $u(t)$



Cortisol "sink"

More realistic or practical implementation of numerically optimal treatment

Optimal Manipulation of HPA Axis



How low and how long:

- Could administer treatment in stages: **looking for a 20% increase in ACTH at rest**
- Smaller reductions in cortisol would require longer treatment
- There is a minimal perturbation however below which the system will simply return to it's fatigued state

Time for questions, but first thank you!

